What is claimed is:

1. An excimer or molecular fluorine laser system, comprising:

a discharge chamber filled with a gas mixture at least including molecular fluorine and a buffer gas;

a plurality of electrodes within the discharge chamber connected to a discharge circuit for energizing the gas mixture;

a resonator including a pair of resonator reflecting surfaces disposed on either side of the discharge chamber for generating a laser beam, said resonator further including a deformable third reflecting surface disposed between the pair of resonator reflecting surfaces;

a line-narrowing/selection unit within the resonator for narrowing the bandwidth of the laser beam;

a detector for detecting the bandwidth of the laser beam; and

a processor for receiving a signal indicative of said bandwidth from said detector and controlling a surface contour of said deformable third reflecting surface to control said bandwidth in a feedback arrangement.

2. The laser system of Claim 1, wherein said deformable third reflecting surface is a highly reflective mirror.

3. The laser system of Claim 1, wherein said deformable third reflecting surface is a cylindrical mirror.

4. The laser system of Claim 1, wherein said deformable third reflecting surface is a spherical mirror.

5. The laser system of Claim 1, wherein said line-narrowing/selection unit includes a beam expander and dispersive element, and wherein said deformable third reflecting surface is disposed between said beam expander and said dispersive element.

6. The laser system of Claim 1, wherein said line-narrowing/selection unit includes a dispersive element, and wherein said deformable third reflecting surface is disposed just before said dispersive element.

7. A line-narrowed excimer or molecular fluorine laser system, comprising:

a discharge chamber filled with a gas mixture at least including molecular fluorine and a buffer gas;

a plurality of electrodes within the discharge chamber connected to a discharge circuit for energizing the gas mixture;

a resonator including a pair of resonator reflecting surfaces disposed on either side of the discharge chamber for generating a laser beam, said resonator further including a third reflecting surface which is deformable and disposed between the pair of resonator reflecting surfaces; and

a line-narrowing/selection unit within the resonator for narrowing the bandwidth of the laser beam.

8. The laser system of Claim 7, further comprising deformation means for controllably adjusting the surface contour of said deformable third reflecting surface.

9. The laser system of Claim 7, wherein said line-narrowing/selection unit includes a beam expander and dispersive element, and wherein said deformable third reflecting surface is disposed between said beam expander and said dispersive element.

10. The laser system of Claim 7, wherein said line-narrowing/selection unit includes a dispersive element, and wherein said deformable third reflecting surface is disposed just before said dispersive element.

11. The laser system of Claim 7, further comprising a processor for automatically adjusting the bandwidth of said laser by sending a signal to adjust said surface contour.

12. The laser system of Claim 11, further comprising a detector for detecting the bandwidth of the laser system and communicating bandwidth information to the processor which controls said bandwidth in a feedback arrangement.

13. A line-narrowed excimer or molecular fluorine laser system, comprising:

a discharge chamber filled with a gas mixture at least including molecular fluorine and a buffer gas;

a plurality of electrodes within the discharge chamber connected to a discharge circuit for energizing the gas mixture;

a resonator including a pair of resonator reflecting surfaces disposed on either side of the discharge chamber for generating a laser beam, said resonator further including a third reflecting surface which is deformable and disposed between the pair of resonator reflecting surfaces;

a line-narrowing/selection unit within the resonator for narrowing the bandwidth of the laser beam; and

a spectrometer for measuring the bandwidth of said laser beam.

14. The laser system of Claim 13, further comprising a processor for receiving data from the spectrometer corresponding to a current bandwidth and for outputting a signal to adjust a surface contour of the deformable third reflecting surface corresponding to a desired bandwidth.

15. The laser system of Claim 13, wherein said line-narrowing/selection unit includes a beam expander and dispersive element, and wherein said deformable third reflecting surface is disposed between said beam expander and said dispersive element.

16. The laser system of Claim 13, wherein said line-narrowing/selection unit includes a dispersive element, and wherein said deformable third reflecting surface is disposed just before said dispersive element.

17. A line-narrowed excimer or molecular fluorine laser system, comprising:

a discharge chamber filled with a gas mixture at least including molecular fluorine and a buffer gas;

a plurality of electrodes within the discharge chamber connected to a discharge circuit for energizing the gas mixture;

a resonator including a pair of resonator reflecting surfaces disposed on either side of the discharge chamber for generating a laser beam, said resonator further including a third reflecting surface which is deformable and disposed between the pair of resonator reflecting surfaces;

a line-narrowing/selection unit within the resonator for narrowing the bandwidth of the laser beam; and

a detector for detecting a parameter of the laser system; and

a processor for receiving a signal indicative of said laser system parameter from said detector and controlling a surface contour of said deformable third reflecting surface in a feedback arrangement.

18. The laser system of Claim 17, wherein said deformable third reflecting surface is a cylindrical mirror.

19. The laser system of Claim 17, wherein said deformable third reflecting surface includes a curvature in two orthogonal cross-sectional beam axis directions.

20. The laser system of Claim 17, wherein said laser system parameter is laser beam bandwidth.

21. The laser system of Claim 17, wherein said line-narrowing/selection unit includes a beam expander and dispersive element, and wherein said deformable third reflecting surface is disposed between said beam expander and said dispersive element.

22. The laser system of Claim 17, wherein said line-narrowing/selection unit includes a dispersive element, and wherein said deformable third reflecting surface is disposed just before said dispersive element.

23. A line-narrowed excimer or molecular fluorine laser system, comprising:

a discharge chamber filled with a gas mixture at least including molecular fluorine and a buffer gas;

a plurality of electrodes within the discharge chamber connected to a discharge circuit for energizing the gas mixture;

a resonator including a pair of resonator reflecting surfaces disposed on either side of the discharge chamber for generating a laser beam, said resonator further including a third reflecting surface which is deformable and disposed between the pair of resonator reflecting surfaces;

a line-narrowing/selection unit within the resonator for narrowing the bandwidth of the laser beam, and

wherein said line-narrowing/selection unit includes a dispersive element, and wherein said deformable third reflecting surface is disposed just before said dispersive element.

24. The laser system of Claim 23, wherein said line-narrowing/selection unit further includes a beam expander, and wherein said deformable third reflecting surface is disposed between said beam expander and said dispersive element.

25. A method of adjusting the bandwidth of a line-narrowed excimer or molecular fluorine laser including a discharge chamber having a gas mixture and a plurality of electrodes therein within a resonator for generating a laser beam, the resonator including a pair of resonator reflectors and a deformable third reflecting surface, comprising the operations:

applying electrical pulses to the plurality of electrodes within said discharge chamber for energizing the gas mixture therein;

measuring a bandwidth of the laser beam; and

adjusting a surface contour of said deformable third reflecting surface for adjusting the bandwidth of the laser beam based on the measured bandwidth.

26. The method of Claim 25, further comprising the operations transmitting a signal to a processor corresponding to the measured bandwidth, and transmitting another signal to the deformable third reflecting surface corresponding to a selected surface contour adjustment.

27. An excimer or molecular fluorine laser, comprising:

a discharge chamber filled with a gas mixture;

a plurality of electrodes in the discharge chamber connected to a pulse power circuit for energizing the gas mixture; and

a resonator for generating a laser beam, including one or more line-narrowing/selection optics, a pair of resonator reflectors and a deformable third reflecting surface having an adjustable surface contour for matching the wavefront of the beam to reduce the bandwidth narrowed/selected by the line-narrowing/selection unit.

28. The laser of Claim 27, wherein the one or more line-narrowing/selection optics include a dispersive element, and wherein the deformable third reflecting surface is disposed just before the dispersive element.

29. The laser of Claim 28, wherein the one or more line-narrowing/selection optics include a beam expander, and wherein the deformable third reflecting surface is disposed between the beam expander and the dispersive element.

30. The laser of Claim 29, wherein the dispersive element is a grating serving as one of said pair of resonator reflectors.

31. The laser of claim 28, the resonator further comprising an interferometric device.

32. The laser of claim 27, wherein the adjustable surface contour of the deformable third reflecting surface is automatically feedback controlled using a processor and a detector for monitoring a spectral parameter of the laser beam.

33. A resonator for an excimer or molecular fluorine laser system, comprising:

a discharge chamber for filling with a gas mixture;

a plurality of electrodes within the discharge chamber for connecting to a discharge circuit for energizing the gas mixture;

a pair of resonator reflectors for generating a laser beam; and

a bi-directional bandwidth controlled folding mirror assembly, the mirror assembly including:

a folding mirror;

a coupling plate coupling with the mirror;

an adjustment spindle penetrating through a cavity defined in the coupling plate, and

wherein screwing the adjustment spindle in a first direction increases a concavity of a surface contour of the folding mirror, and screwing the adjustment spindle in a second direction opposite to said first direction decreases the concavity of the surface contour of the folding mirror.

34. The resonator of Claim 33, further comprising at least one spring disposed between a portion of said coupling plate and a head of said adjustment spindle.

35. The resonator of Claim 33, further comprising a movable nut on the adjustment spindle.

36. The resonator of Claim 33, further comprising a motor for motorizing the adjustment spindle.

37. The resonator of Claim 33, wherein the surface contour of the folding mirror is convex.

38. The resonator of Claim 33, wherein the surface contour of the folding mirror is concave.

39. The resonator of Claim 33, further comprising a line narrowing/selection unit including at least one optical element having an adjustable orientation for tuning a wavelength of the laser beam, and wherein said adjusting of said surface contour of said folding mirror adjusts the bandwidth of the laser beam.

40. The resonator of Claim 39, wherein the line narrowing/selection unit includes a beam expander and a dispersive element, and wherein the folding mirror is disposed between the beam expander and the dispersive element.

41. The resonator of Claim 33, wherein the bi-directional bandwidth controlled folding mirror assembly is configured such that the surface contour of the folding mirror is adjustable based on signals received from a detector for monitoring the bandwidth of the laser beam.

42. A resonator for an excimer or molecular fluorine laser system, comprising:

a discharge chamber for filling with a gas mixture;

a plurality of electrodes within the discharge chamber for connecting to a discharge circuit for energizing the gas mixture;

a pair of resonator reflectors for generating a laser beam; and

a bi-directional bandwidth controlled folding mirror assembly, the mirror assembly including:

a folding mirror;

a coupling plate coupling with the mirror;

a piezo transducer coupled with the coupling plate, and

wherein operating the piezo transducer in a first direction increases a concavity of the folding mirror, and operating the piezo transducer in a second direction opposite to said first direction decreases a concavity of the folding mirror.

43. The assembly of Claim 42, wherein the folding mirror is convex.

44. The assembly of Claim 42, wherein the folding mirror is concave.

45. The resonator of Claim 42, further comprising a line narrowing/selection unit including at least one optical element having an adjustable orientation for tuning a wavelength of the laser beam, and wherein said adjusting of said surface contour of said folding mirror adjusts the bandwidth of the laser beam.

46. The resonator of Claim 42, wherein the line narrowing/selection unit includes a beam expander and a dispersive element, and wherein the folding mirror is disposed between the beam expander and the dispersive element.

47. The resonator of Claim 42, wherein the bi-directional bandwidth controlled folding mirror assembly is configured such that the surface contour of the folding mirror is adjustable based on signals received from a detector for monitoring the bandwidth of the laser beam.